Growing Low Potassium Grass Hay for Close-up Dry Cows

Mike McFadden
Extension Dairy Educator
Central Michigan

Early lactation cows often experience low blood calcium due to the demands of the onset of lactation. The resulting hypocalcemia can result in milk fever, retained placenta and mastitis as well as other metabolic disorders (1). High concentrations of potassium (K) in forages fed to dry cows can have a large influence on the incidence of hypocalcemia in early lactation cows.

Implementation of a separate management group, for dry cows that are from 3 to 4 weeks before calving, enables the feeding of a special transition diet. A primary goal is to reduce the concentration of K consumed by the cows before calving (1). The purpose of this article is to provide information on managing K concentrations in the diet of close-up dry cows.

Low K Rations

There are several methods for managing dietary K concentrations in transition cow diets. Inclusion of significant amounts of low K corn silage and (or) straw can lower ration K. A second approach utilizes the addition of blood acidifying anionic supplements to the ration. Low K grains or other feedstuffs also may be employed to dilute and reduce the K concentrations in transition rations. A fourth method is to produce and feed low-K hay forage specifically for the close-up cows on the farm.

Production of Low-K Hay

Several factors play important roles in the production of low-K hay forages. The first factor is selection of forage to be grown. Grasses generally are lower in K than legumes. Among the species of grass, there are differences in both K content and cultural characteristics. Research has shown that timothy is the grass species that has the lowest K content as well as acceptable persistence over a wide range of agronomic conditions (2). For wetter soils, a second choice could be reed canarygrass.

Fields where soil tests low in K are the best choices for growing dry cow forages. Fine textured soils with higher clay contents tend to be soils that test higher in K content. Application of fertilizers is also critical to production of low K forages. Nitrogen applied at spring green-up at 100 lb actual N per acre and another 100 lb actual N after first cutting can result in yields that approach 6 tons of dry hay per acre. Potassium fertilizer applications as well as manures should...
not be done in order to maintain low soil K. First year forage may have high K content as excess soil K is removed by the crop. Forage production in subsequent years should be lower in K and well suited for feeding programs for transition cows. Forage content less than 0.8% K may be indicative of soil K concentrations that are too low to permit optimal forage yields. Additional small amounts of K may be needed for these soils to allow reasonable forage yields.

Research has shown that second cuttings of grass will have lower K concentrations than first cuttings from the same field. Harvesting grasses with greater maturity also will result in lower plant K concentrations. For this reason grasses that are intended for close-up dry cows should not be cut early in the season. It also is worth noting that K concentrations are lower when a forage is harvested as dry hay versus harvested as silage.

**Keys to Producing Low-K Dry Cow Grass Hay**
- Choose timothy or reed canary grass and avoid orchard-grass
- Soil test to select and monitor low K fields for growing close-up dry cow hay
- Apply 100 lb actual N at spring green up and after first cutting
- Avoid K fertilizers and manures until demonstrated as needed
- Take two cuttings per year harvested as dry hay if possible
- Store low K hay separately for feeding to close-up dry cows
- Utilize wet chemistry feed analysis to balance rations and monitor forage K concentrations
- Table 1 shows tons of low-K hay needed for close-up dry cows annually.

**References**

**Table 1. Minimum low-K grass hay requirements for dry cows fed 10 lb per cow/day for a 60-day dry period.**

<table>
<thead>
<tr>
<th></th>
<th>100-Cow Dairy</th>
<th>500-Cow Dairy</th>
<th>1000-Cow Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons Required per Year</td>
<td>30</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>Acres Needed</td>
<td>10</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>